

APPENDIX C
REGULATIONS, STANDARDS, PROTOCOLS

Regulations, Standards, Protocols

The majority of applicable regulations, standards and protocols impacting the FAA's plans to upgrade the current A/G communications system to the future system are related to frequency allocations and management. For reference, the present allocation of the VHF nav/comm resource available for A/G communications is illustrated by Figure C-1. The following excerpts from RTCA SC-172-119, Signal-in-Space Minimum Aviation System Performance Standards (MASPS) for Advanced VHF Digital Data Communications Including Compatibility with Digital Voice Techniques, ²¹ Section 1, address the regulations, standards, and protocols associated with the current and future VHF A/G communications system:

"The characteristics of the present A/G VHF communications system are contained in the Federal Communications Commission (FCC) Rules (47 CFR Part 87), the ICAO Standards and Recommended Practices (SARPs) (Annex 10, Volume I, Chapter 4 Paras. 4.5 - 4.7), RTCA Minimum Operational Performances Standards (MOPS) (RTCA/DO-186) and in ARINC Characteristic 716-7. These documents set forth the minimum mandatory and desired operational performance standards for the existing VHF A/G communications systems. For the Future Digital VHF A/G Communications System, the Minimum Aviation System Performance Standards (MASPS) for Advanced VHF Digital Data Communications Including Compatibility with Digital Voice Techniques (RTCA/DO-119-SC-172) addresses the physical layer and the media access control lower sublayer of Layer 2 of the Open System Interconnection (OSI) model."

It has long been recognized that the civil aviation requirements for A/G voice communication in the 117.975 - 137 MHz VHF band vary widely from region to region just as the frequency and the number of flights vary. Projected shortages in communications channels have resulted in the need to improve the utilization of this frequency band."

"The service rules for the use of 117.975 - 137 MHz are contained in the FCC's Rules Part 87 -- Aviation Services (47 CFR Part 87). General Operating and Flight Rules are contained in the Federal Aviation Regulations (14 CFR). Rules pertaining to aeronautical VHF communications are established by the FCC and the FAA."

"FCC Rules Part 87 Subpart C (Sections 87.69 - 87.111) Operating Requirements and Procedures for the Aviation Radio Services addresses, among other things, maintenance, tests, frequency measurements, and transmitter adjustment and test. Subpart D (Sections 87.131 - 87.187) Technical Requirements addresses power and emissions, frequency stability, bandwidth of emission, types of emission, emission limitations, modulation requirements, acceptability of transmitters for licensing, and type acceptance of equipment."

"Avionics units operating in the VHF AM(R)S A/G communications frequency band must meet the following Technical Standard Order

(TSO) or satisfy the essential technical requirements of these TSOs as required during the certification process:

TSO-C37c, VHF Radio Communication Transmitting Equipment
Operating Within Radio Frequency Range 117.975 - 136.000 MHz; and

- Insert Figure C-1, The VHF Nav/Comm Resource

-

TSO-C38c, VHF Radio Receiving Equipment Operating Within Radio Frequency Range 117.975 - 136.000 Mhz."

"These TSO requirements are based in large part on RTCA/DO-156 and RTCA/DO-157, MOPS for Airborne Radio Communications Equipment Operating Within Radio Frequency Range 117.975 - 136.000 MHz. Updates to TSO-C37c and TSO-C38c (TSO-C37d and TSO-C38d) are based on RTCA/DO-186, MOPS for Airborne Radio Communications Equipment Operating Within Radio Frequency Range 117.975 - 137.000 MHz. FAA VHF A/G transmitters must satisfy the following requirement: Any spurious frequency emission shall be at least 80 dB below the carrier level of the subject transmission. Ground transmitter power can range from below 10 Watts to 50 Watts; the higher level is normally used only for service radii that are over 60 nm or in particularly difficult terrain."